

In the claims:

1. (Amended) A method of extracting, by evaporation, solid residue in suspension and/or in solution in fluid matter containing volatile substances, the method comprising the steps of:

a) applying in a zone on a hot face of a heat exchange wall a fluid matter to be treated in the form of a thin layer with solid residue therein, the heat exchange wall being heated to a temperature that is high enough to cause volatile substances contained in the fluid matter to evaporate;

b) crushing the layer of fluid matter with solid residue therein against the hot face to level it and to encourage crumbling and spreading thereof;

c) evaporating substantially all the fluid matter leaving the solid residue on the hot face;

d) recovering substantially all the solid residue by scraping it off the hot face; and wherein a further step includes

(e) expanding greatly in volume the fluid matter with solid residue therein immediately before applying it to the hot face so as to give it the consistency of a foam, such that it is the foam which is applied in the form of a thin layer on the hot face.

2. (Amended) The method according to claim 1, wherein in the step of expanding greatly in volume, the volume of the fluid matter with solid residue therein is expanded by a factor in the range of 20 to 100.

3. (Amended) The method according to claim 1, including the additional step of eliminating solid residue remaining adhered to the hot face after recovering substantially all solid residue in order to prepare the hot face for a subsequent application of fluid matter with solid residue therein to the zone.

4. (Amended) A method of extracting, by evaporation, solid residue in suspension and/or in solution in fluid matter containing volatile substances, the method comprising the steps of:

a) applying in a zone on a hot face of a heat exchange wall a fluid matter to be treated in the form of a thin layer with solid residue containing farm-yard manure therein, the heat exchange wall being heated to a temperature that is high enough to cause volatile substances contained in the fluid matter to evaporate quickly;

b) crushing the layer of fluid matter with solid residue therein against the hot face to level it and to encourage crumbling and spreading thereof;

c) evaporating substantially all the fluid matter leaving the solid residue on the hot face;

d) recovering substantially all the solid residue by scraping it off the hot face; and wherein a further step includes

e) expanding greatly in volume the fluid matter with solid residue therein immediately before applying it to the hot face so as to give it the consistency of a foam for application onto the hot face.

5. (Amended) A machine for extracting solid residue to be found in suspension and/or in solution in fluid matter containing volatile substances, the machine comprising:

a) a heat exchange wall having a hot face which is heated to a temperature that is high enough to cause volatile substances contained in the fluid matter to evaporate to leave the solid residue;

b) feeder and applicator means adapted to cause the fluid matter with solid residue therein to expand greatly in volume and to give it the consistency of a foam immediately before it is applied to the hot surface and for feeding and applying the fluid matter with solid residue therein to be treated onto the hot face in the form of a thin layer;

c) crushing means for encouraging crumbling and spreading of the layer of fluid matter with solid residue therein on the hot face; and

d) scraper means to recover at least a portion of the solid residue that has formed.

6. (Amended) The machine according to claim 5, in which the heat exchange wall with the hot face is movable in a horizontal plane in an advancing direction, and wherein the feeder and applicator means includes a box placed over the hot face, the box being downwardly open and having an open side facing in the advancing direction of the movable heat exchange wall, the box and the hot face defining a chamber in which the fluid matter with solid residue therein expands.
7. (Amended) The machine according to claim 6, wherein the feeder and applicator means includes a positive displacement pump having an Archimedes' screw constituted by a brush mounted to rotate in a feed duct in fluid communication with the box.
8. (Amended) The machine according to claim 6, wherein the box has a top wall whose bottom face lies in a horizontal plane parallel to the hot face, the top wall being movable in a vertical direction so as to be capable of being lowered and pressed against the hot face in order to clean it.
9. (Amended) The machine according to claim 6, wherein the box has a top wall moveable in a vertical direction so as to be capable of being lowered and pressed against the hot face in order to clean it, and controllable motive means connected to the top wall to cause the top wall of the box to be lowered and pressed against the hot face in a cyclical manner.
10. (Amended) The machine according to claim 6, wherein the box has a flared outline defining a narrow zone when seen from above, and the fluid matter with solid residue therein is fed into the box through the narrow zone.
11. (Amended) The machine according to claim 5, wherein the crushing means has at least one flexible sheet which is pressed against the fluid matter with solid matter therein by resilient means.

12. (Amended) The machine according to claim 11, wherein the at least one flexible sheet is coupled to a reciprocating driver.
13. (Amended) The machine according to claim 11, wherein the at least one flexible sheet is made of polytetrafluoroethylene.
14. (Amended) The machine according to claim 5, wherein the scraper means has a battery of cascading scrapers, each scraper connected to a driver providing each scraper a cyclical motion following a substantially elliptical path.
15. (Amended) The machine according to claim 5, in which the heat exchange wall having a hot face is a rotary disk defining an outside edge wherein the scraper means is arranged to transfer the solid residue progressively towards the outside edge to cause the solid residue to drop into a vertical collector well.
16. (Amended) The machine according to claim 15, further including an additional scraper suitably positioned to scrape the outside edge of the disk.
17. (Amended) The machine according to claim 15, further including a fixed circularly arcuate side panel disposed beside the rotary disk immediately downstream from the feeder and applicator means and oriented to prevent the fluid matter with solid residue therein from leaving the hot face.
18. (Amended) The machine according to claim 15, further including means for mechanically removing solid residue that remains stuck to the hot face, the means for mechanically removing being situated downstream in the advancing direction of the heat exchange wall defined on the rotary disk from the scraper means and upstream from the feeder and applicator means.
19. (Amended) The machine according to claim 18, wherein the means for mechanically removing the solid residue has a pick-up metal sheet associated with at least one removal wormscrew.

20. (Amended) The machine according to claim 19, wherein the means for mechanically removing is adapted to evacuate the solid residue towards an outside edge of the heat exchange wall on the rotary disk.
21. (Amended) The machine according to claim 15, comprising a plurality of the rotary disks, each defining heat exchange walls mounted on a common vertical axis, each wall extending to an outer edge of the disks and further including a heated annular collector track disposed vertically beneath the edges of the disks for collecting solid residue.
22. (Amended) The machine according to claim 21, further including a set of scrapers in the collection track rotating synchronously with the plurality of rotary disks and adapted to move solid residue found therein towards an evacuation hole situated above a collector well.
23. (Amended) The machine according to claim 21, further including a scraper adapted to scrap off solid residue adhering to a bottom face of at least one disk so that the solid residue is dislodged from the bottom face.
24. (Amended) The machine according to claim 21, in which at least two of the disks are hollow and are carried by a tubular shaft having an inside space in communication with the inside space of the hollow disks, the spaces constituting a condensation chamber, the hollow disks being mounted inside an evaporation chamber, and means for extracting vapor produced in the evaporation chamber, means for mechanically compressing the vapor, and means for introducing the compressed vapor into the condensation chamber.
25. (Amended) The machine according to claim 5, further including means for extracting and compacting all of the solid residue.

26. (Amended) The machine according to claim 5, further including means for washing the hot face in hot water.

27. (Amended) The machine according to claim 7, wherein the box has a top wall whose bottom face is a horizontal plane and parallel to the hot face, the top wall being movable in a vertical direction so as to be capable of being lowered and pressed against the hot face in order to clean it.

28. (Amended) The machine according to claim 5, in which the heat exchange wall is a rotary disk and having a vertical axis wherein the scraping means are arranged to transfer the solid residue progressively towards an outside edge of the rotary disk and to cause it to drop into a vertical collector well and further including means for mechanically removing solid residue that remains stuck to the hot face, the means for mechanically removing being situated downstream in the advancing direction of the heat exchanging wall defined on the rotary disk from the scraper means and upstream from the feeder and applicator means.